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Understanding How Streamer's Self-Presentation in E-Commerce Live Streaming Affects Consumers: The Role of Persuasion Knowledge

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Abstract: In recent years, live streaming has become the mainstream way of online shopping in China. As the dominant player and performer in live streaming, streamers play a crucial role in consumers' purchase decisions. Therefore, this study focuses on the self-presentation behavior of streamers in the context of e-commerce live streaming and explores the mechanism of its influence on consumers' purchase intention from the perspective of persuasion knowledge. A total of 538 consumers from China participated in this anonymous survey. The results indicate that helpful and empathetic behaviors of streamers can significantly enhance consumers' purchase intention, while derogatory, exaggerated, and flattering behaviors of streamers can significantly diminish consumers' purchase intention. Persuasion knowledge played a mediating role and had a significant negative impact on purchase intention, while anticipated inaction regret weakened its effect on purchase intention.

Keywords: e-commerce live streaming; self-presentation behavior; persuasion knowledge; anticipated regret; purchase intention

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1. Introduction

In the era of rapidly advancing digital technology and the stay-at-home economy, e-commerce live streaming has become a mainstream form of online consumption [1]. In 2022, key e-commerce platforms in China hosted over 120 million live-streaming sessions, attracting more than 1.1 trillion views, according to the data from the Ministry of Commerce of China. By integrating product display, interaction, and transactions, live streaming provides consumers with a more immersive, convenient, and entertaining shopping experience, catering perfectly to the needs of fast-paced consumers seeking convenience and engagement [2].

Streamers play a crucial role as product promoters in live streaming, using their language and performances to capture consumers' attention and stimulate their desire to purchase [3,4]. However, due to the low entry barriers in the live-streaming industry, some streamers lack professional product knowledge and ethical standards [5], often resorting to exaggerated promotional techniques or flattering language. While such behavior can momentarily capture viewers' attention, it may ultimately harm consumer trust and severely damage the reputations of both the brand and the live-streaming platform [6].

Existing research has explored various aspects of streamers, such as different types [7], characteristics [8,9], and language styles [6] that enhance sales in live streaming. However, these studies have not adequately addressed the impact of more multidimensional self-presentation behaviors of streamers on consumers. The real-time nature of live streaming amplifies the visibility of streamers' behaviors, making them more observable. Therefore, when examining the field of e-commerce live streaming, the impact of streamers' behavior must be considered.

Moreover, previous studies have primarily focused on fostering positive cognition and emotions in consumers, such as value perception, pleasure, and emotional trust [9,10] within the context of e-commerce live streaming. However, few studies have examined the impact of negative emotions on consumers' purchase decisions. In online shopping, consumers have numerous options and significant autonomy. If consumers feel uncomfortable with a streamer's behavior, they can quickly switch to alternative live streams or shopping channels without incurring any additional costs. Therefore, it is essential to consider the role of negative emotional fluctuations induced by streamers' self-presentation behaviors on consumers' live purchase decisions.

With the proliferation of online shopping and the emergence of various pitfalls, consumers display an unprecedented level of sensitivity and vigilance toward the behavior and rhetoric of streamers, especially if they have previously been misled by marketers [6]. This scrutiny may arise from the activation of persuasion knowledge, which encompasses a comprehensive understanding of the salesperson's persuasive objectives, intentions, underlying motives, and strategies [11]. When consumers' persuasion knowledge is activated, they tend to develop a defensive mindset and even skepticism, leading to a more meticulous evaluation of the streamers' statements. Consequently, this heightened scrutiny significantly influences consumers' purchase intentions.

Given the heightened consumer attention to streamers' actions and statements, this study investigates the impact mechanisms of five self-presentation behavior patterns—helpful behavior, empathetic behavior, flattering behavior, derogatory behavior, and exaggerated behavior—on individuals' live purchasing intentions. This study specifically examines the mediating role of persuasion knowledge and its negative impact on purchase intentions. Additionally, it verifies the buffering effect of anticipated inaction regret on the negative impact caused by activated persuasion knowledge. This research provides more dimensional reference information for businesses to persuade "skeptical consumers" and offers stronger strategic support for improving service quality and product sales in e-commerce live-streaming operations.

2. Literature Review and Hypothesis Development

2.1. Self-Presentation

The concept of self-presentation was first introduced by Goffman in 1949, who described social interactions as performances where individuals act as performers on a stage [12]. He suggested that people use language, facial expressions, and body language to present themselves, aiming to create a favorable impression and influence others to align with their intended actions, ultimately facilitating cooperative interactions and gaining rewards [12]. Subsequent studies have shown that any effort to manage or influence others' perceptions, leading them to see one's behavior in alignment with one's desires, falls under self-presentation [13].

Early research primarily focused on the self-presentation strategies individuals employ in real-life scenarios. For instance, Jones and Pittman (1982) categorized these strategies into five types: ingratiating, self-promotion, self-labeling, pleading, and threatening [13].

With the advent of mobile internet, research on self-presentation has expanded to online spaces, such as social media and live-streaming platforms. Significant portions of this research examine motivations and forms of self-presentation in online environments, including platforms like Facebook [14,15], online dating sites [16,17], and community websites [18]. These studies found that individuals tend to showcase positive and idealized self-images on online platforms to present more perfect personal traits [19,20].

Some studies have highlighted the impact of self-presentation on consumers' purchasing motivations. Kim et al. (2012) argued that the desire for self-presentation in virtual communities drives individuals to purchase digital goods [18]. Jimenez-Barreto et al. (2022) confirmed that self-presentation motives can enhance brand loyalty and the purchase of "cool" products [21]. However, discussions on how self-presentation impacts individual consumer behavior remain limited. Most research focuses on how individ-

uals' self-presentation motives shape their consumption behavior, while discussions on how others' self-presentation affects consumer behavior are scarce. This gap limits our understanding of the relationship between self-presentation and consumer behavior.

2.2. Self-Presentation Behavior and Purchase Intention

To gain consumer recognition and achieve sales goals, streamers exhibit various behaviors to influence consumer purchases, which constitutes self-presentation in e-commerce live streaming. During live streaming, consumers often rely on the streamer's introduction to obtain relevant product information, and their decision-making process is inevitably influenced by these self-presentation behaviors [22]. Studies have shown that salespeople are dedicated to providing consumers with detailed product information [23,24] and utilizing emotional communication to forge a connection with them in order to achieve sales objectives [25]. However, some salespeople may adopt strategies such as exaggerating themselves, belittling competitors, or flattering consumers to achieve sales goals [26,27].

Therefore, based on the long-term observation of e-commerce live streaming and in conjunction with the classification of self-presentation strategies proposed by Jones and Pittman (1982), as well as previous research on behaviors that salespeople may adopt in persuasive marketing contexts, this paper categorizes streamers' self-presentation behaviors into five types: helpful, empathetic, flattering, exaggerated, and derogatory behaviors. It is important to note that this classification is limited to the real-time behavior exhibited by streamers in e-commerce live streaming and does not include behavior in non-e-commerce scenarios, such as social media and public interviews.

Helpful behavior involves providing timely assistance and reasonable advice to consumers. For example, streamers may show the appearance of products, demonstrate their functions, try on clothing, and recommend suitable products based on consumers' demands in the interactive live chat. These behaviors offer practical shopping guidance and enhance positive emotions during the shopping process [22,23]. Additionally, the research on offline shopping indicates that salespeople with professional knowledge can provide more assistance to customers, increasing the likelihood of purchases [28]. We believe that streamers' helpful behavior can improve consumers' understanding of products, reduce their concerns about online shopping, and increase their willingness to purchase during live broadcasts. Therefore, we propose the following hypothesis:

Hypothesis 1a: *The helpful behavior of the streamer has a significant positive impact on consumers' willingness to purchase during live broadcasts.*

Empathetic behavior refers to the tendency of individuals to align their views with others or to form emotional connections with them. In the context of live streaming, this behavior is exhibited by the streamer's ability to understand and empathize with the consumer's perspective. Early marketing research has shown that empathy is significantly related to salesperson performance and is crucial for successful sales interactions [29]. This characteristic can better fulfill viewers' emotional needs during the shopping process and enhance their shopping experience [25,30]. When observing e-commerce live streaming, we found that some streamers kindly remind consumers to pay attention to safety on their way home and not to watch live streaming while walking. Others advise viewers to consume rationally based on their financial situation and to buy only suitable products. These reminders and small gestures of care can make viewers feel more sincere and warm, increasing their trust in the streamer and their willingness to purchase through live streaming. Accordingly, we propose the following hypothesis:

Hypothesis 1b: *The streamer's empathetic behavior has a significant positive impact on consumers' willingness to purchase through live streaming.*

Flattering behavior involves actions that elevate the customer's status or appearance to please them. Individuals often engage in flattering behavior to win favor or meet expec-

tations and realize their interests [31,32]. During live-streaming interactions, particularly on short video platforms, streamers often flatter viewers to boost sales. Some streamers deliberately praise viewers with expressions like "The brothers who enter the live-streaming room are handsome, even their walking posture is handsome". Psychologists suggest that individuals are more likely to accept positive statements about themselves [33]. Marketers often use this approach to create a positive impression, but it can also undermine consumers' perception of sincerity, leading to a negative attitude toward the marketer and their products [34,35]. Previous research on flattering persuasion has primarily focused on offline shopping contexts. This paper argues that live streaming provides a mirrored performance scene where flattery and deliberate ingratiation are instantly recorded and magnified [36]. Furthermore, the spatial distance makes it challenging for consumers to form an emotional connection with the streamer, making flattering behavior more noticeable and deliberate. This, in turn, may negatively impact purchase intention. Based on these considerations, we propose the following hypothesis:

Hypothesis 1c: *The streamer's flattering behavior has a significant negative impact on consumers' purchase intention.*

Derogatory behavior involves intentionally comparing and denigrating similar products and other streamers. Observations of live streaming reveal instances where some streamers purposefully denigrate competitors or competing products to sway consumers' emotions and bolster their reputations [37]. When presenting products, certain streamers emphasize their superiority by extensively disparaging similar ones. Additionally, in response to comments about other streamers or products, streamers may display strong negative reactions, such as eye-rolling or sneering, and may make statements like "Products of this standard are not worthy of comparison with ours" or "It's all because that broadcaster monopolizes the market that we have the lowest price limit". As a form of comparative behavior, derogatory speech carries a strong personal bias, stemming from an unfair self-assessment rather than a fair and objective comparison. Such biased comments often increase skepticism due to their lack of objectivity. Research has shown that, compared to objective product comparisons, marketing tactics lacking objectivity do not result in favorable product evaluations and marketing effects [38]. Furthermore, when streamers denigrate others or products, they may use aggressive or implied negative language and display contemptuous expressions. Although denigration can achieve self-promotion, this negative behavior can reduce consumers' enjoyment and potentially affect their level of liking for the brand. If consumers' enjoyment and liking levels decrease, they may be less willing to purchase products during the live broadcast. Based on the above factors, we propose the following hypothesis:

Hypothesis 1d: *The streamer's derogatory behavior has a significant negative impact on consumers' purchase intention.*

Exaggerated behavior involves overstating the features of products and excessively emphasizing one's abilities. Streamers often introduce products in a highly praiseful manner, exaggerating the benefits, and some even label themselves with unrealistic "expert" titles to attract consumer interest. Notably, several streamers have been criticized by official bodies for exaggerated promotions on air. It is essential to investigate whether such exaggerated publicity, even at the risk of violating regulations, actually increases consumers' willingness to purchase products. Previous research has shown that consumers tend to have negative attitudes toward highly complimentary product claims [39]. When the irrationality of the complimentary behavior increases, consumers' attitudes toward the product worsen, and their willingness to accept the product decreases [40,41]. This study argues that, in an era of abundant products and information exchange, consumers have accumulated shopping experience, enabling them to judge product value and quality. Although a streamer's exaggerated expressions may initially arouse interest, they may lead

to a negative advertising effect, repelling consumers and decreasing their willingness to purchase. Thus, the following hypothesis is proposed:

Hypothesis 1e: *The streamer's exaggerated behavior has a significant negative impact on consumers' willingness to purchase.*

2.3. Persuasion Knowledge

As previously stated, prior research has not thoroughly examined the influence of negative emotions on assessing consumer choices. However, contemporary consumers are inundated with information from various sources, leading to information overload [42]. This overload heightens consumer sensitivity and wariness toward marketing manipulation, making persuasion more challenging. Therefore, it is crucial to focus on the activation and impact mechanisms of persuasion knowledge, a negative mental state, within the realm of e-commerce live streaming.

The concept of persuasion knowledge was first proposed by Friestad and Wright (1994) [11]. Initially, persuasion knowledge was viewed as a loose cognitive or intuitive understanding that people gain through their practical experiences and reflections on marketing processes. In the persuasion knowledge model, persuasion knowledge is one of three types of knowledge that consumers possess, along with agent knowledge and topic knowledge [11]. Subsequent research has shown that persuasion knowledge encompasses consumers' understanding and beliefs about salespeople's persuasive goals, intentions, potential motives, and strategies, including both rational and emotional judgments [43–46].

When individuals perceive the manipulative motives and strategies of marketers, their persuasion knowledge may be activated, leading to a defensive and negative psychological response toward the marketers. Research indicates that the process of marketing persuasion and related semantic cues can influence the extent to which consumers' persuasion knowledge is activated. Factors such as flattery by marketers [47], negative advertising comparisons [48], unreasonable price comparisons [49], inappropriate brand placements [50], the use of rhetorical questions [51], biased information sources [52], and expensive default options [53] can all activate individuals' persuasion knowledge.

Overall, the impact of these factors and marketing methods can be categorized into two main types: the influence of the information source and the influence of the information content. When the perceived credibility of the information source is higher, especially if the source is an expert or someone the consumers consider trustworthy, consumers' resistance to marketing persuasion decreases [54]. Conversely, when the information content contains more semantics or cues related to "persuasion" and "selling", viewers are more likely to perceive the marketers' ulterior motives and strategies, leading to a higher degree of persuasion knowledge activation [55,56].

The theory of psychological reactance provides a framework for understanding individuals' responses to persuasive information. According to this theory, external factors influence individuals when they perform actions. When people perceive that their freedom of choice is being deprived or threatened, they experience psychological reactance [57]. To re-establish a sense of freedom, individuals respond to perceived threats based on their severity and the importance of the threatened freedom. These responses can include sadness, anger, hostility, and even extreme or dangerous behaviors that contradict the threat. The greater the perceived threat and the more significant the threatened freedom, the stronger the individual's desire to restore their freedom, resulting in a more intense reactance response [58].

In marketing persuasion research, scholars have extensively studied psychological reactance. Edwards et al. (2002) investigated the impact of mandatory pop-up advertisements on consumer annoyance, confirming the mediating role of psychological reactance. Quick and Stephenson (2007) examined how different intensities of persuasive messages affect consumer attitudes and psychological reactions, finding that excessive exposure to

persuasive messages leads individuals to feel their shopping freedom is being deprived, resulting in more negative attitudinal responses [59,60].

2.4. The Mediating Effect of Persuasion Knowledge and Its Effects on Purchase Intention

In the context of live streaming, the streamer serves as a crucial source of information for consumers seeking product details. Their role is to convey information and promote products using language and emotional appeal during explanations and interactions. A streamer's professionalism and credibility hinge on their ability to help customers understand products and answer questions with their expertise. Accordingly, we propose that the streamer's helpful behavior can effectively reduce the activation of persuasion knowledge.

Empathetic behavior aims to create an emotional resonance between consumers and streamers, fostering closeness and shifting attention from sales intentions to shared preferences and emotions. This shift in attention undoubtedly disrupts consumers' speculations about the streamer's underlying sales motives and strategies, thereby reducing the activation of persuasion knowledge. Moreover, research on the fan effect has shown that empathetic interactions between internet celebrities and their fans can strengthen fans' feelings of attachment and increase their trust [61]. Thus, we hypothesize that empathetic behavior from streamers weakens consumers' resistance and suspicion by diverting attention and deepening trust, reducing persuasion knowledge activation.

Flattery is used by individuals to build positive interpersonal relationships and obtain corresponding rewards. In some contexts, flattering behavior can enhance others' pleasure. However, research also suggests that, compared to post-shopping praise, pre-shopping flattery by marketers is more likely to result in poorer evaluations of product and service attitudes [47]. E-commerce live streaming is a persuasive environment where streamers have strong self-interested motives. Inappropriate flattery raises consumer suspicions about the marketer's motives, leading to doubts about product authenticity. This results in negative emotions toward marketers and refusal to follow recommendations. Hence, we argue that streamers' flattering behavior can activate higher levels of persuasion knowledge.

Disparaging peers or similar products may appear to emphasize one's own product's advantages, but it is highly subjective and deliberative. Consumers often expect streamers, as crucial information sources, to provide impartial information and recommendations. However, derogatory behavior reduces consumers' perceptions of objectivity. Additionally, such behavior by streamers can be perceived as an intentional attempt to manipulate public opinion, making consumers more vigilant. Therefore, we believe that streamers' derogatory behavior can activate higher levels of persuasion knowledge.

Excessively praising products or elevating their status usually carries evident promotional intent, making persuasive signals more detectable and prompting consumers to use persuasion knowledge to counteract marketing [47]. Furthermore, from the perspective of message recipients, exaggerated speech and actions often imply excessive hype, impacting the perceived authenticity of the information [62]. Accordingly, when streamers excessively praise product quality, discount intensity, and themselves, it is likely to increase consumers' suspicions regarding the streamer's motives and strategies. Consequently, we believe that streamers' exaggerated behavior can activate higher levels of persuasion knowledge.

Based on the above reasoning, this study presents the following hypotheses:

Hypothesis 2a: *A streamer's helpful behavior can significantly reduce the activation of persuasion knowledge.*

Hypothesis 2b: *A streamer's empathetic behavior can significantly reduce the activation of persuasion knowledge.*

Hypothesis 2c: *A streamer's flattering behavior can activate higher levels of persuasion knowledge.*

Hypothesis 2d: *A streamer's derogatory behavior can activate higher levels of persuasion knowledge.*

Hypothesis 2e: *A streamer's exaggerated behavior can activate higher levels of persuasion knowledge.*

A substantial body of research confirms that the activation of persuasion knowledge leads to an increase in consumers' negative coping responses. Individuals may develop psychological resistance as a result of perceiving attempts to persuade or control them, leading to engagement in resisting marketing persuasion behaviors. Additionally, meta-analysis further validates the significant detrimental impact of persuasion knowledge on marketing persuasion [46].

Compared to consumers whose persuasion knowledge is not activated, those whose persuasion knowledge is activated generally exhibit poorer default product choice intentions [53], purchase intentions [63,64], product recommendation intentions [56], advertising attitudes [63,65], and online public praise [44]. For instance, if consumers perceive an advertisement's source and information as credible but also detect hidden manipulative intentions, such as attempting to solicit empathy for donations or evoke guilt, they may feel manipulated or even angry due to untimely appeals in the advertisement, resulting in negative attitudes toward the advertisement and the brand [65].

In the context of persuasive e-commerce live streaming, the streamer's varying self-presentation behaviors are expected to prompt consumers to use persuasion knowledge. The more the persuasion knowledge is activated, the stronger the consumers' defensive and skeptical attitudes toward the streamer's persuasive motives and strategies become, and the weaker their overall identification with the live stream [66]. As a result, consumers become less willing to accept the streamer and the recommended products, reducing their likelihood of being persuaded to make a purchase.

Consequently, it can be inferred that, in the live-streaming shopping environment, once an individual's persuasion knowledge is activated, consumers will become more defensive and skeptical toward the motives and strategies used by streamers, which in turn reduces the likelihood of being persuaded to buy the goods and services recommended by the streamers. In light of this, we propose the following hypotheses:

Hypothesis 3: *Persuasion knowledge has a significant negative impact on consumers' purchase intention.*

Hypothesis 4a: *Persuasion knowledge plays a mediating role between the streamer's helpful behavior and consumers' purchase intention.*

Hypothesis 4b: *Persuasion knowledge plays a mediating role between the streamer's empathetic behavior and consumers' purchase intention.*

Hypothesis 4c: *Persuasion knowledge plays a mediating role between the streamer's flattering behavior and consumers' purchase intention.*

Hypothesis 4d: *Persuasion knowledge plays a mediating role between the streamer's derogatory behavior and consumers' purchase intention.*

Hypothesis 4e: *Persuasion knowledge plays a mediating role between the streamer's exaggerated behavior and consumers' purchase intention.*

2.5. The Moderating Effect of Anticipated Inaction Regret

Regret is a more or less painful emotional state [67]. In uncertain decision-making scenarios, anticipated regret can influence an individual's final choice [68,69]. The concept of anticipated regret can be further divided into two types: anticipated inaction regret and anticipated action regret. Anticipated inaction regret is the regret consumers expect to feel in the future for not taking action now. In contrast, anticipated action regret is the regret

consumers expect to feel in the future for taking action now [70]. Regarding the intensity of these two regrets, studies have found that, in the short term, individuals experience stronger regret for actions taken than for those not taken. However, in the long term, regret for actions not taken is stronger [71].

In e-commerce live streaming, services like hassle-free returns and shipping insurance protect consumer rights and reduce anticipated action regret [72]. Additionally, live-streaming environments use visual and auditory elements, special discounts, and limited-time offers to create a tense and exciting shopping atmosphere. This atmosphere strongly influences consumers psychologically and makes it easier to trigger anticipated inaction regret due to fears of missing out on deals [73]. Therefore, this study explores how anticipated inaction regret affects the relationship between persuasion knowledge and purchase intention in live streaming.

Research suggests that both risk-averse and risk-seeking individuals tend to make choices that minimize regret rather than risk [74,75]. To avoid inaction regret, people are more likely to take action, even if it involves certain risks [76,77]. In the context of shopping, discounted products are significant triggers for anticipated inaction regret [78,79]. To avoid regret, consumers are inclined to make impulsive purchase decisions [80].

Since anticipated inaction regret is a powerful emotion that can alter individual intentions [76,77], this study hypothesizes that it can buffer the negative impact of persuasion knowledge on purchase intention in live streaming. Specifically, under various promotional stimuli, consumers are likely to experience anticipated inaction regret while watching live streams. Even when persuasion knowledge is activated and individuals recognize the streamer's persuasive motives [46], they may prioritize avoiding regret over their skepticism. Consequently, consumers might overlook their skepticism and resistance to the streamer's persuasive tactics, developing a strong purchase intention. Thus, the following hypothesis is proposed.

Hypothesis 5: *Anticipated inaction regret can negatively moderate the relationship between persuasion knowledge and purchase intention, meaning that the higher the level of anticipated inaction regret, the less significant the negative effect of persuasion knowledge on purchase intention.*

2.6. Proposed Model

Based on the hypotheses presented above, to thoroughly explore the impact mechanism of streamer's self-presentation behavior on consumer behavior in the context of e-commerce live streaming, this study proposes the following research model (Figure 1):

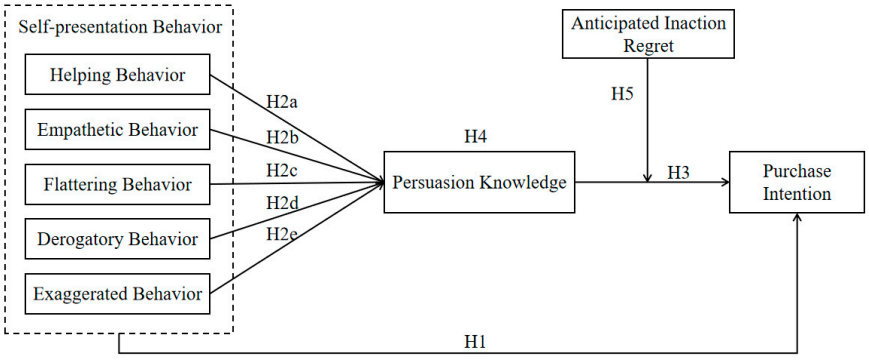

Figure 1. Theoretical model.

3. Method

3.1. Measures

The survey questionnaire comprised 35 single-choice questions. The first section included eight items of basic information, such as gender, age, online shopping experience, and whether the respondent had watched live e-commerce broadcasts. The survey auto-

matically terminated if the respondent had not watched an e-commerce live streaming in the past month.

The second section contained 27 items related to the research variables. The self-presentation behavior scale was based on studies by Cialdini and Richardson (1981) [81], Jones and Pittman (1982) [13], Medler-Liraz and Yagil (2013) [82], and Vossen and Valkenburg (2016) [83]. Each type of self-presentation behavior variable included three items. For the measurement of persuasion knowledge, this study referred to Campbell and Kirmani (2000) [47], incorporating a total of four measurement items. The anticipated inaction regret scale was based on Patrick et al. (2009) [84], including four measurement items. The purchase intention scale primarily referenced Zeitham and Berry (1996) [85], encompassing three measurement items. These items were adjusted to fit the specific shopping scenarios of e-commerce live streaming and Chinese reading habits. Measurement was conducted using a five-point Likert scale, with responses ranging from "strongly disagree" to “strongly agree”.

3.2. Participants and Data Collection

The questionnaire was distributed through various online platforms, including WeChat groups, Moments, Taobao group chats, and QQ groups, using the Questionnaire Star link. To encourage participation, a reward was offered upon completion of the questionnaire.

The survey was conducted between 24 January and 28 February 2022. Before the survey, participants received an explanatory letter outlining the study’s purpose and assuring the anonymity and security of their information. A total of 622 questionnaires were collected. After excluding questionnaires with no recent live viewing and purchasing experience within the past month, those with identical Likert scale responses, and those completed in less than 60 s, 538 valid questionnaires were obtained and used as the research sample for this study. The survey results indicate that 55.58% of respondents are female and slightly more than 44.42% are male respondents. The majority of respondents (74.91%) were under the age of 40 years old. Additionally, over 80% of respondents held a bachelor’s degree or higher. The survey also covered consumers with varying shopping experiences and live viewing frequencies. Table 1 provides more detailed data on the respondents.

Table 1. Basic statistical information of the respondents.

Categorization	N	Proportion
Gender		
Male	239	44.42%
Female	299	55.58%
Age (years)		
Under 18	84	15.61%
18–28	207	38.48%
29–40	112	20.82%
41–55	80	14.87%
55+	55	10.22%
Educational level		
High school and below	20	3.72%
Specialized education	93	17.29%
Bachelor	244	45.35%
Master	143	26.58%
PhD	38	7.06%
Average monthly disposable income		
Under CNY 1000	91	16.91%
CNY 1001–3000	186	34.57%

Table 1. *Cont.*

Categorization	N	Proportion
CNY 3001–5000	110	20.45%
CNY 5001–10,000	98	18.22%
CNY 10,000+	53	9.85%
Shopping experience		
1 year or less	108	20.07%
1–3 years	143	26.58%
3–5 years	108	20.07%
5+ years	179	33.27%
Frequency of live viewing		
Several times a week	160	29.74%
Several times a month	195	36.25%
Several times in half a year	110	20.45%
Several times a year	73	13.57%
Viewing platform		
Taobao	171	31.78%
JDcom	69	12.83%
Kwai	112	20.82%
Tik Tok	135	25.09%
Temu	51	9.48%
Total	538	100.00%

3.3. Reliability and Validity Analysis

3.3.1. Reliability Analysis

The Cronbach's alpha values for the eight study variables exceeded 0.80, and the Corrected Item-Total Correlation (CITC) values for the scale items surpassed 0.50. The overall Cronbach's alpha values for the respective variables did not show a significant improvement when individual items were excluded, indicating that the questionnaire has good reliability for further research and analysis. Detailed reliability analysis results are provided in Table 2.

Table 2. Reliability analysis results.

Variable	Question Items	Corrected Item-Total Correlation (CITC)	Cronbach's Alpha (Removing This Item)	Cronbach's Alpha
Helpful behavior (Medler-Liraz and Yagil, 2013) [82]	The streamer is able to accurately demonstrate the functions and features of the item when introducing the product.	0.79	0.87	0.90
	The streamer is able to respond accurately to my questions when recommending products.	0.82	0.84	
	The streamer is able to make appropriate product purchase suggestions.	0.81	0.86	
Empathetic behavior (Vossen and Valkenburg, 2016) [83]	The streamer shows great interest in my questions and follow-ups.	0.72	0.81	0.86
	The streamer shows interest in and understands my perspective on issues.	0.71	0.82	
	The streamer empathizes with my feelings.	0.77	0.77	

Table 2. *Cont.*

Variable	Question Items	Corrected Item-Total Correlation (CITC)	Cronbach's Alpha (Removing This Item)	Cronbach's Alpha
Flattering behavior (Jones and Pittman, 1982) [13]	The streamer will compliment me on my meter and other things not related to the product.	0.66	0.83	0.84
	The streamer will show kindness by expressing a nice concern for my daily life.	0.71	0.78	
	The streamer will cater to my ideas and make me find him or her likable.	0.76	0.73	
Derogatory behavior (Cialdini and Richardson, 1981) [81]	The streamer will demean others to enhance her image.	0.65	0.73	0.80
	The streamer will blather on about a competitor's shortcomings.	0.64	0.74	
	The streamer will trumpet the shortcomings of a product or competitor.	0.66	0.73	
Exaggerated behavior (Cialdini and Richardson, 1981) [81]	The streamer will exaggerate his or her own strengths (e.g., strong expertise) when recommending a product.	0.71	0.77	0.84
	The streamer will exaggerate the advantages of a product when recommending it.	0.69	0.78	
	The streamer will exaggerate the infrequency of live product offers when recommending a product.	0.71	0.77	
Persuasion knowledge (Campbell and Kirmani, 2000) [47]	The streamer's behavior makes me feel that he is only concerned with convincing me to buy the product.	0.69	0.87	0.89
	The streamer's behaviors and recommendations make me feel like he or she is trying to make more personal profit.	0.79	0.84	
	I feel manipulated by the streamer's behaviors and strategies.	0.73	0.86	
	I feel the streamer's persuasive intent to influence me is clear.	0.79	0.84	
Anticipated inaction regret (Patrick et al., 2009) [84]	I may regret not buying during the live streaming if the item is in short supply.	0.79	0.88	0.90
	I may regret not buying during the live streaming if others around me have bought it.	0.78	0.88	
	I may regret not buying during the live streaming if the price increases in the future.	0.82	0.86	
	I may regret not buying during the live streaming if the item goes out of stock.	0.76	0.89	

Table 2. *Cont.*

Variable	Question Items	Corrected Item-Total Correlation (CITC)	Cronbach's Alpha (Removing This Item)	Cronbach's Alpha
Purchase intention (Zeitham and Berry, 1996) [85]	I am likely to buy products recommended by the streamer during the live streaming.	0.67	0.76	0.82
	If necessary and conditions allow, I will purchase products recommended by the streamer during the live streaming.	0.70	0.73	
	I will consider buying products recommended by the streamer by watching live streaming in the future.	0.66	0.77	

3.3.2. Validity Analysis

AMOS 24.0 was used to test the fitness of the validated factor analysis model. The results indicate favorable goodness-of-fit indices: $\chi^2/df = 1.492$, RMSEA = 0.03, AGFI = 0.913, GFI = 0.948, and both CFI and IFI = 0.983. These indices suggest that the model fits the data well and is suitable for subsequent validity analysis.

The standardized factor loadings of the measurement items for the eight latent variables were all above 0.7, the average variance extracted (AVE) values were all above 0.5, and the composite reliability (CR) values were all above 0.7. These results satisfy the criteria for convergent validity, indicating that this study has good convergent validity. Detailed results are shown in Table 3. Furthermore, the correlation coefficients between the eight latent variables and other variables were less than the square root of the AVE of each latent variable, indicating satisfactory discriminant validity.

Table 3. Results of convergent validity analysis.

Pathway		Standardized Factor Loadings	AVE	CR
Helpful behavior	BZ1	0.84	0.76	0.90
	BZ2	0.90		
	BZ3	0.87		
Empathetic behavior	GQ1	0.81	0.67	0.86
	GQ2	0.79		
	GQ3	0.86		
Flattering behavior	YH3	0.88	0.65	0.85
	YH2	0.79		
	YH1	0.73		
Derogatory behavior	BD1	0.78	0.58	0.80
	BD2	0.75		
	BD3	0.75		
Exaggerated behavior	FD3	0.80	0.64	0.84
	FD2	0.78		
	FD1	0.82		
Persuasion knowledge	SF1	0.74	0.66	0.89
	SF2	0.87		
	SF3	0.77		
	SF4	0.87		

Table 3. *Cont.*

Pathway		Standardized Factor Loadings	AVE	CR
Anticipated inaction regret	HH1	0.84	0.70	0.90
	HH2	0.83		
	HH3	0.88		
	HH4	0.81		
Purchase intention	GM1	0.77	0.61	0.82
	GM2	0.80		
	GM3	0.76		

Discriminant validity measures how well a variable is distinguished from other variables after empirical testing, indicated by low correlations between latent variables. Table 4 demonstrates that the correlation coefficients between the eight latent variables and other latent variables are all less than the square root of the average variance extracted (AVE) value for each latent variable. This result suggests that the discriminant validity of the scales used in this study is robust.

Table 4. Results of discriminant validity analysis.

	Helpful Behavior	Empathetic Behavior	Derogatory Behavior	Exaggerated Behavior	Flattering Behavior	Persuasion Knowledge	Purchase Intention	Anticipated Inaction Regret
Helpful behavior	0.871							
Empathetic behavior	0.467	0.82						
Derogatory behavior	−0.243	−0.429	0.76					
Exaggerated behavior	−0.168	−0.295	0.42	0.798				
Flattering behavior	−0.238	−0.282	0.35	0.321	0.804			
Persuasion knowledge	−0.294	−0.537	0.525	0.502	0.396	0.814		
Purchase intention	0.411	0.533	−0.536	−0.5	−0.46	−0.655	0.778	
Anticipated inaction regret	0.131	0.212	−0.088	−0.099	−0.043	−0.203	0.257	0.838

3.4. Common Method Bias Test

To test for common method bias, the Harman one-factor test was conducted. The unrotated exploratory factor analysis extracted eight factors with eigenvalues greater than 1, and the variance explained by the largest factor was 30.11%, which is below the 40% threshold. This suggests that common method bias is not a serious concern in this study.

4. Results

4.1. Hypothesis Testing

This study employs structural equation modeling (SEM) to conduct hypothesis testing and path analysis. Prior to the path analysis, the model's fitness was evaluated. The χ^2/df value of the model was 1.813, RMSEA was 0.039, AGFI was 0.930, GFI was 0.948, and both CFI and IFI were 0.976. All indices met the required standards, indicating that the structural equation model constructed in this study accurately reflects the relationships in the actual data.

The regression results for each variable were analyzed individually. Hypotheses 1a and 1b propose that streamers' helpful and empathetic behaviors significantly increase consumers'

purchase intentions (β1a = 0.153, p1a < 0.001; β1b = 0.135, p1b = 0.011). Hypotheses 1c to 1e suggest that streamers' flattering, derogatory, and exaggerated behaviors significantly decrease consumers' purchase intentions (β1c = −0.155, p1c < 0.001; β1d = −0.153, p1d = 0.004; β1e = −0.162, p1e < 0.001). All five hypotheses were significant at $p < 0.05$ and were supported.

Hypotheses 2a and 2b propose that streamers' helpful and empathetic behaviors significantly reduce the activation of persuasion knowledge (β2a = −0.014, p2a = 0.755; β2b = −0.316, p2b < 0.001). Hypotheses 2c to 2e suggest that streamers' flattering, derogatory, and exaggerated behaviors significantly increase the activation of persuasion knowledge (β2c = 0.139, p2c = 0.002; β2d = 0.226, p2d < 0.001; β2e = 0.267, p2e < 0.001). Hypotheses 2b to 2e were significant at $p < 0.05$ and were supported. However, streamers' helpful behaviors did not significantly impact persuasion knowledge (p2a = 0.755 > 0.05). Therefore, Hypothesis 2a was not supported.

As for Hypothesis 3, which proposes that persuasion knowledge has a significant negative effect on live-streaming purchase intention, the path is statistically significant (β = −0.314, $p < 0.001$), thus supporting Hypothesis 3. Figure 2 displays the standardized path coefficients and significance tests among the variables.

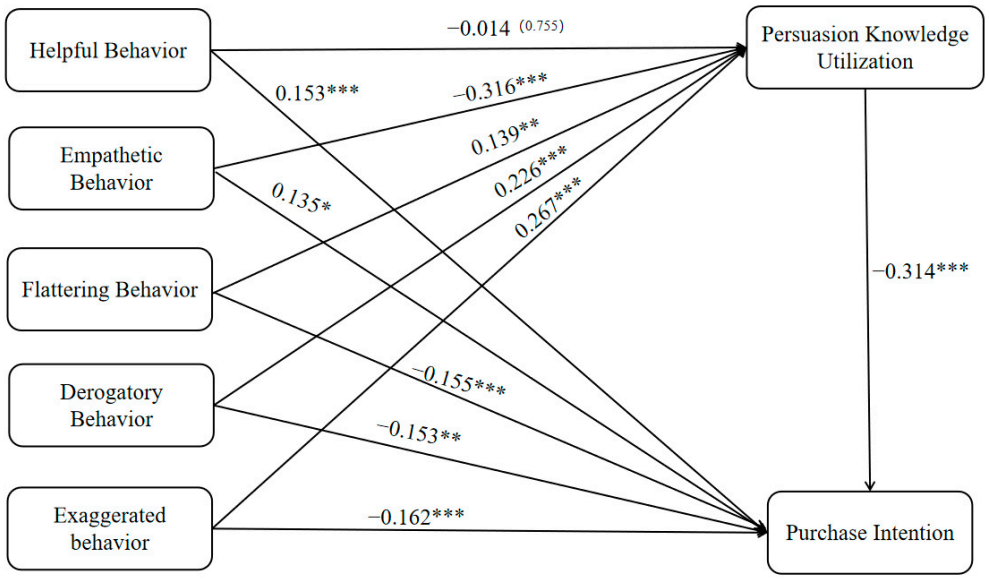

Figure 2. Path test between variables. N = 538; * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$.

4.2. Mediation Effect Test

To validate the mediating effect of persuasion knowledge, this study employed the bootstrap method with 5000 resamples. The non-standardized mediating effect test results, presented in Table 5, indicate that persuasion knowledge mediates the relationship between empathetic, flattering, derogatory, and exaggerated behaviors and purchase intention (95% boot CI excluding 0, $p < 0.05$). However, persuasion knowledge does not mediate the relationship between helpful behaviors and purchase intention (95% boot CI [−0.020, 0.028], $p > 0.05$). Consequently, Hypothesis 4a is not supported, whereas Hypotheses 4b–4e are supported.

Table 5. Non-standardized mediation effect test.

Path	Effect	SE	Bias-Corrected 95% CI	Percentile 95% CI
Helpful behavior → Persuasion knowledge → Purchase intention	0.003	0.012	[−0.020, 0.028]	[−0.020, 0.028]
Empathetic behavior → Persuasion knowledge → Purchase intention	0.086	0.021	[0.051, 0.135] ***	[0.049, 0.130] ***

Table 5. *Cont.*

Path	Effect	SE	Bias-Corrected 95% CI	Percentile 95% CI
Flattering behavior → Persuasion knowledge → Purchase intention	−0.034	0.013	[−0.064, −0.013] ***	[−0.061, −0.011] **
Derogatory behavior → Persuasion knowledge → Purchase intention	−0.070	0.021	[−0.122, −0.036] ***	[−0.116, −0.034] ***
Exaggerated behavior → Persuasion knowledge → Purchase intention	−0.078	0.020	[−0.126, −0.045] ***	[−0.121, −0.043] ***

N = 538; ** $p < 0.01$, *** $p < 0.001$.

4.3. Moderation Effect Test

The moderating effect of anticipated inaction regret was analyzed using hierarchical regression analysis with SPSS 25.0. To reduce multicollinearity, the means of the independent variable (X) and the moderator variable (Z) were centered.

Model 1: Regression analysis of purchase intention with seven control variables showed that demographic variables do not significantly affect purchase intention ($p > 0.01$), thus excluding disturbance terms' effects.

Model 2: Adding persuasion knowledge to Model 1 revealed a significant negative effect on purchase intention ($\beta = -0.551$, $p < 0.001$), increasing the model's explanatory power by 28.6% ($\triangle$R2 = 0.286).

Model 3: Adding anticipated regret of inaction to Model 2 showed a significant positive effect on purchase intention ($\beta = 0.134$, $p < 0.001$), increasing the model's explanatory power by 1.7% ($\triangle$R2 = 0.017).

Model 4: Including the interaction term (persuasion knowledge × anticipated inaction regret) in Model 3 indicated a significant positive effect on purchase intention ($\beta = 0.185$, $p < 0.001$), improving the model's explanatory power by 3.3% ($\triangle$R2 = 0.033, F = 30.452).

These results suggest that the interaction between persuasion knowledge and anticipated inaction regret significantly positively affects purchase intention, as depicted in Figure 3. In other words, anticipated inaction regret significantly weakens the negative impact of persuasion knowledge on purchase intention. The higher the level of anticipated inaction regret, the weaker the negative effect of persuasion knowledge on purchase intention, thereby supporting Hypothesis 5.

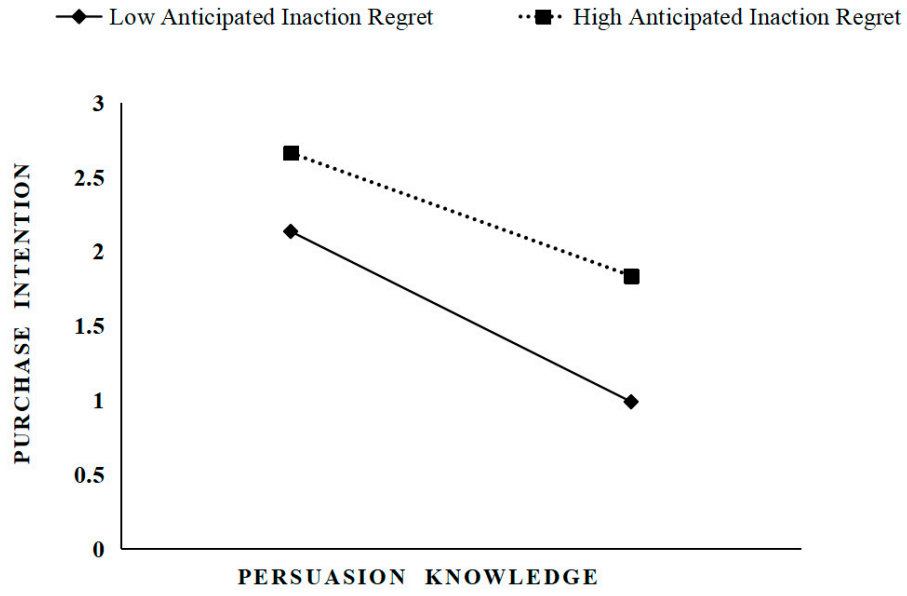

Figure 3. The moderating role of anticipated inaction regret.

5. Discussion

This study proposed 17 hypotheses, of which 15 were validated. Hypothesis 2a (a streamer's helpful behavior can significantly reduce the activation of persuasion knowledge) and Hypothesis 4a (persuasion knowledge plays a mediating role between the streamer's helpful behavior and consumers' purchase intention) were not supported. A potential reason for this could be the emphasis on specific behaviors, such as product demonstration and problem explanation, in the helpful behavior scale design. Due to increased shopping options and higher consumer expectations, these behaviors are now deemed necessary for a qualified e-commerce streamer. Thus, helpful behaviors do not reduce skepticism or resistance toward the streamer's persuasive motives. Instead, they may enhance purchase intentions by positively influencing psychological or cognitive states, such as perceived usefulness [86] or trust [11].

6. Theoretical Implications

Previous research has primarily focused on the motivations and methods of self-presentation by individuals, with limited attention to the impact of self-presentation behaviors on consumer psychology and behavior. Even fewer studies have explored how an individual's self-presentation influences others' purchase decisions [87–89]. This study categorizes and conceptually defines the self-presentation behaviors exhibited by streamers in e-commerce live-streaming settings, examining the impact of five behavioral modes on consumers' psychology and purchase decisions. This approach not only provides a new perspective for analyzing the role of self-presentation in marketing contexts but also enriches research on e-commerce live streaming from the streamers' perspective.

Research on live-stream marketing has predominantly focused on trust and positive emotions, such as joy [11]. However, this study shifts the focus to defensive coping psychology, validating the mediating role of persuasion knowledge. This offers a new lens for comprehensively understanding consumers' cognitive and emotional states in live-streaming contexts [90]. Additionally, this research explores how different self-presentation behaviors of streamers affect persuasion knowledge, expanding the antecedent variable system of persuasion knowledge and providing data support for its application in future marketing scenarios.

Moreover, previous studies have mainly confirmed the negative impact of persuasion knowledge on behaviors, such as purchase intention [63,64], rarely considering the buffering effect of certain factors. This study verifies the buffering effect of anticipated inaction regret on this mechanism and elucidates its significance in the consumer purchase decision-making process. This finding delves into the deeper implications of anticipated regret in influencing behavioral strength and offers a novel perspective for future research on persuasion knowledge.

7. Practical Implications

Given the continuous improvement in consumer shopping experiences and rational consumption awareness, the e-commerce live-streaming industry faces developmental bottlenecks, including decreased user viewership and conversion rates. Relying solely on the fan effect is insufficient to drive the innovative development of e-commerce live streaming. A broader perspective is needed to explore changes in consumer cognition and emotion in live shopping contexts.

This paper investigates the impact of five types of self-presentation behaviors by streamers on persuasion knowledge and purchase intentions. It provides theoretical insights for e-commerce live-streaming platforms and businesses. These insights can help promote consumption upgrading and service innovation, thereby contributing to the sustainable development of this new form of consumption.

Moreover, China hosts the world's largest e-commerce market, distinguished by an extensive user base and rapid growth. This study examines the market within the unique context of Chinese culture, which values group identity and emphasizes humility. These

cultural traits result in distinctive consumer behaviors and e-commerce influencer dynamics. Through comprehensive empirical analysis, this study provides valuable insights and makes significant contributions to global e-commerce research.

8. Limitations and Future Directions for Improvement

First, the data acquisition process has limitations. Participants were asked to recall recent live events they witnessed within the past month when completing the survey. This may weaken subjective situational perception and memory. Specifically, when assessing the five self-presentation behaviors of streamers, participants had to reflect on recent live-streaming events and evaluate the streamers' behaviors based on their perceptions. This approach could lead to a gap in accuracy compared to real-time perception. To enhance data acquisition precision, contextual or natural experiments can be conducted to gather real-time physiological response data, such as facial expressions, eye movements, and electroencephalography data. This could help mitigate data bias caused by memory impairment in consumer perception.

Second, there are limitations regarding the choice of research variables. This paper focuses on the impact of the streamer's five self-presentation behaviors on consumers' purchase intentions, identifying the streamer as the primary stimulus source and independent variable. However, it does not consider the effects of other environmental or co-watcher cues on persuasion knowledge in live marketing contexts. These contexts involve a complex interplay of environmental cues, product cues, co-watchers, and streamers as stimulus cues. Future research can explore the mechanisms by which stimuli, such as ambient atmosphere and product type, affect consumers' psychological and cognitive states and purchase decisions. Additionally, regarding consumers' internal state variables, this paper focuses solely on the mediating variable of persuasion knowledge. It does not compare it with negative psychological mechanisms such as psychological resistance, skepticism, or perceived lack of control. Future research could explore the effect size and influence differences among these negative psychological mechanisms to enhance the theoretical framework.

Third, the lack of differentiation in relevant variables limits this research. Currently, the study does not control for or differentiate key control variables, such as consumers' characteristics, type of live-streaming platform, or type of streamer. These omissions affect the breadth and applicability of the conclusions. Future research should consider including variables like consumers' personal characteristics, streamer types, product categories, and live platform types. This approach would clarify the influence mechanisms of different consumer characteristics or types of e-commerce platforms in live-streaming contexts. Such a detailed analysis would significantly expand the research framework of persuasion knowledge and live-streaming marketing, offering a more nuanced understanding of these dynamics.

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